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ABSTRACT

The experience of the research library of International Flavors and Fragrances using on-line data bases is described. On-line searches of Chemical Abstracts condensates and other data bases are compared with the library's previous experience with manual indexes. Two tables show the number of literature searches conducted and the time required. (Author/DS)

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ON-LINE COMPUTER LITERATURE SEARCHING IN THE SMALL-TO-MEDIUM SIZE RESEARCH LIBRARY. A COMPARISON OF RESULTS IN 1973 AND 1974 PERIODS

by

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Small-to-medium special libraries have difficulties getting information. Lack of money to acquire and space to store secondary (abstract) sources causes problems. Manual searching is often too slow. When a special field is profitable, there is little incentive to enter other areas. Nevertheless, information requested in outside fields is sometimes urgently needed.

At the research library of International Flavors & Fragrances, Inc., we recognized a likely solution to these problems when, in 1973, we became aware of on-line computer data bases. Our access was by telephone using a printer-terminal at 30 characters per second. Since these services were priced as used, economics were favorable. Such sources cost $15 to $80 per terminal-connect-time hour. For small-to-medium R & D libraries, on-line sources offered a means of providing services comparable to large information centers fully staffed with searchers and having extensive hard copy resources.

Searching Chemical Abstracts Sources

Previously Chemical Abstracts(CA), Beilstein, and books in flavor and fragrance chemistry relating to organic synthesis and natural products were our sources. Searching CA subject indexes through knowledge of nomenclature sources was a familiar approach.

Material published since the latest subject index was available only through perusal of up to 40 keyword indexes of CA issues. Because they contain the latest and frequently the best information, they should be searched. Before on-line searching, Chemical Titles and Chemical Abstracts Condensates bridged the gap between the appearance of CA issues and their subject indexes. Because of the growth in published information, it became difficult to use the CA subject indexes. Slow turn around and high costs discouraged our batch use of Condensate tapes.

CA Condensates could be searched quickly on line with less effort and sometimes greater thoroughness than the subject indexes. Response was instantaneous, even with hugh data bases. Search strategy could be changed during an inquiry. This provided an enormous advantage over batch searching. We could cover in one data base what had been done manually by examining the several semiannual indexes published after the latest subject index.

From Table 1 we see that 87 literature searches were completed between April and June, 1973, before on-line searching was used. CA was consulted as the major source.

During the like 1974 period, 92 literature searches were completed. This fact is not shown in Table 1 because sources other than CA or the Condensates were also involved. Manual searching in the subject indexes alone was used on 17 searches. 56 searches were performed involving CA Condensates on line back to 1972. This data base is called CHEMCON by System Development Corporation (SDC), the supplier. Eleven of the 56 also involved CHEM7071, SDC's name for the Condensates on line for 1970 and 1971.

Seventeen plus 56, or 73 literature searches were based on CA information. For the 56 involving CHEMCON, there was a slight decrease in the average number of working days between the start and finish of a search. In 1973, the average was 3.95 days compared to 3.43 days in 1974 with CHEMCON, the April-to-June period being compared for each year. 1973 coverage stopped at the latest subject index. If hand searching of the keywords of subsequent CA issues had been attempted, results would have been more favorable for computer searching. There was an average difference of 17.15 working days between request and completion of the 17 searches without the computer in the 1974 period. While this big difference was not typical, it nevertheless supported the

assertion that the computer helped speed searching. These differences represent more than searching, since the searchers frequently also handled other assignments during these times.

Computer searching usually takes a few minutes, but search completion involves other tasks. Older literature is searched manually and the total results written up for the requestor. Average time per search dropped from 3.8 hours in 1973 to 3.5 hours in 1974. Of more significance, the average differences between the date of the search and the date of the secondary source improved from one year 34 days in 1973 to 23 days in the 1974 period.

Searching Other Data Bases

While 92 literatue searches were completed in the 1974 second quarter compared to 87 for 1973, only 73 of the 92 were based on CA sources. In 1973, we searched CA for almost everything because it was our principal secondary source. Others were too expensive to buy retrospectively as hard copy because so little of their contents was of interest. Because a computer searches thousands of references quickly, we attained a vast increase in searching capability addressing other data bases on line. Statistics on their use appear in Table 2. Printing of abstracts is possible for all but MEDLINE

and MEDCOMP.

(1) MEDLINE covers 1200 leading medical journals reviewed in Index Medicus, 1970 to 1973. MEDLINE is supplemented by MEDCOMP for the 2400 journals reviewed in Index Medicus, January 1974 to date. Nine MEDLINE and four MEDCOMP searches were finished in 1974's second quarter. Most were for two requestors, but the results were of interest to the highest levels of management. Because of MEDLINE and MEDCOMP, we dropped our subscription to Index Medicus.

(2) TOXLINE of the National Library of Medicine covers (a) the Toxicity Bibliography, 1967 to current,

(b) Chemical and Biological Activities, 1965 to current,

(c) International Pharmaceutical Abstracts, 1970 to current,

(d) Abstracts of Health Effects of Environmental Pollutants, 1972 to current,

(e) Pesticides Abstracts, 1966 to current,

(f) Hayes file on Pesticides, 1940 to 1966.

Nome of these existed in our library before on-line services became available. TOXLINE and MEDLINE/MEDCOMP could replace Biological Abstracts from 1965 for companies requiring toxicological information on chemicals rather than general biological information.

(3) CHEMLINE is a thesaurus for the compounds in TOXLINE. Nomenclature from CHEMLINE helps in searching. Retrievable information includes; (a) CA names, frequently from both 8th and 9th Collective indexes; (b) Chemical Abstracts Service (CAS) Registry Numbers; (c) molecular formulas; (d) trivial names; and (e) Wiswesser Line Notation (WLN) names for 11% of the compounds. Fragments of systematic and WLN names can be searched. CAS Registry Numbers are easiest entries to use to find information from TOXLINE. They appear for every compound named. The table shows no CHEMLINE data because we kept no records on it.

(4) CAIN includes journals, serials, monographs, and federal and state government reports indexed by the National Agricultural Library. CAIN is a good supplement to CHEMCON. A major CAIN component, Bibliography of Agriculture, has not been purchased regularly as hard copy at our library.

(5) PATS(Predicast Abstract Terminal System) covers Chemical & Electronics Abstracts of Predicast, Inc. Production statistics, plant construction, product introductions, and marketing information are uniquely located by the computer program. On-line and off-line print options include printing of tables.

(6) Psychological Abstracts is available back to 1967. Hard copies were never acquired. However, this source has been valuable and opened up areas never searched here.

(7) ABI/INFORM, or Abstracts of Business Information, covers business literature from 1971. It is strong on advertising and financial information. It has been of value and along with PATS may replace a subscription to Business Periodicals and, to some extent, Applied Science and Technology Index.

(8) NTIS(National Technical Information Service) indexes unclassified reports from government laboratories and contractors. This source hadn't been used here before coming on line. On two occasions we received useful information.

Many literature search requests resulting in the 43 searches listed in Table 2 required using more than one data base. 110 computer searches were performed to complete 92 literature search requests. 82% of the 92 involved computer data bases.

Evaluation and Costs

Subject information in CA Condensates is not as complete as in CA and its indexes. Sophisticated computer searching of chemical information is feasible as illustrated by TOXLINE and CHEMLINE. Complete searching capabilities are limited by the data entered.

When the CA subject indexes become available on line, searching results should be excellent.

Hard copy users of the other data bases may also recognize some disadvantages. Drawbacks would probably be related to input limitations rather than to computer techniques. We were pleased to obtain much information of interest from sources that were either unknown or previously inaccessible.

We averaged 6.44 minutes of terminal time per search. Most data bases cost $60 per terminal-connect-time hour, allowing for some off-line prints at $.08 per citation. An average computer literature search cost us $6.44.

Suppliers

We used four computer service suppliers:

(1) System Development Corporation (SDC) supplied CHEMCON, CHEM7071, and CAIN. MEDLINE and MEDCOMP emanated from the Pharmaceutical Manufacturers Association through SDC's computer and program.

(2) Lockheed Information Systems supplied PATS, Psychological Abstracts, ABI/INFORM and NTIS. The latter two are also available from SDC. Lockheed also offered CAIN, and later CA Condensates from 1972.

(3) Informatics, Inc. first supplied TOXLINE as TOXICON, and its Chemical Dictionary.

(4) National Library of Medicine supplied TOXLINE directly in April and later CHEMLINE, its name for the dictionary.

LIT. SEARCHES FROM CA SOURCES, APRIL-JUNE, '73 AND '74

MODE	YR.	NO. OF SEARCHES	AVE. NO. OF DAYS/SEARCH	SEARCH DATE-SOURCE DATE
MANUAL	'73	87	3.95	1 YR. 34 DAYS
MANUAL	'74	17	17.15	1 YR. 31 DAYS
WITH CHEMCON	'74	56	3.43	23 DAYS
WITH CHEM7071	'74	11	3.90	NOT PERTINENT

TABLE 2

SEARCHES FROM NON-CA SOURCES, APRIL-JUNE, '74

DATA BASES	NO. OF SEARCHES	AVE. NO. OF DAYS/SEARCH
MEDLINE	9	2.9
MEDCOMP	4	2.9
TOXLINE	8	2.4
CAIN	8	4.3
PATS	5	3.4
PSYCH. ABS.	4	3.4
ABI/INFORM	3	6.7
NTIS	2	7.1